

6. Irene

Program Name: Irene.java

Input File: irene.dat

Semiprime numbers are an important part of the algorithms used to develop public and private keys in the field of public key cryptography. Irene has recently taken a job for a security company that develops communications security systems for various clients. Her job is to develop a program that will determine if a value is a semiprime.

A semiprime number is a composite number that is the product of two (possibly equal) prime numbers.

Discrete semiprime numbers (sometimes called **square free semiprimes**) are those that are not squares of prime numbers. Examples include 15, 26 and 35.

$$3 \times 5 = 15$$

$$2 \times 13 = 26$$

$$5 \times 7 = 35$$

49 is semiprime but it is not discrete because it is the product of 7×7 .

Help out Irene by writing a program that will determine if a number is a **semiprime**, **discrete semiprime** or **neither**.

Input: A number N that represents the number of values to be checked followed by N values X, each on a separate line, where for every X value, $2 < X < 2,147,483,647$.

Output: For each number print the value followed by a single space and DISCRETE SEMIPRIME, SEMIPRIME or NOT SEMIPRIME.

Sample input:

```
5
15
16
49
35
72
```

Sample output:

```
15 DISCRETE SEMIPRIME
16 NOT SEMIPRIME
49 SEMIPRIME
35 DISCRETE SEMIPRIME
72 NOT SEMIPRIME
```